How to Make a Simple Radio Telescope

Updated April 25, 2017 *By Steven J. Wamback*

Radio astronomy is the science of using radio waves to explore the universe. Radio receivers are used to listen to the sun, the moon, the Earth itself, Jupiter, the Milky Way and even objects in other galaxies. All of these bodies emit radio frequency (RF) energy, which you can listen to with various types of radio receivers and antenna systems. When you hear the hiss of white noise on vacant frequencies (channels) between radio and television stations, you are listening to the electromagnetic energy of the sun, Jupiter or both. You can make the simplest radio telescope using an ordinary satellite dish antenna and a signal strength meter to monitor the sun.

Gather your materials and mount the satellite dish antenna to a rotatable Lazy Susan. Either new or used parts will work just fine depending on your budget.

Use the standard dish-mounting hardware and the Lazy Susan to ensure you can adjust or rotate your antenna both horizontally and vertically so that you can aim it anywhere easily.

Connect one end of a 6-foot CATV cable to one of the LNB (low noise block) connectors on the dish and connect the other end to the LNB connector on the satellite signal strength meter.

Attach terminating resistors to any unused CATV connectors on the LNB to prevent signal loss. Some DirecTV dish LNBs have four terminals, so you will attach your coax to one connector and the terminal resistors to the other three.

Solder the small RF choke in series (in line) with the center conductor (positive) of the other 6-foot CATV coax section and attach a male coax connector to the other end of the coax. This coax will connect the 12- to 16-volt power supply to the signal meter.

Connect the RF choke end of the power supply cable to the 12- to 16-volt power supply or battery pack. The battery pack configuration allows for remote operation of your radio telescope away from potential electrical noise. Be sure to connect the center coax conductor (with RF choke) to the positive (+) terminal of the power supply or battery pack.

Connect the male connector end of the power supply cable to the “SAT Rx” connector terminal on the satellite signal strength meter. This is where the meter normally draws power from the CATV control box. Your radio telescope is now complete.

Tips

Warnings

- References
- About the Author
- Photo Credits

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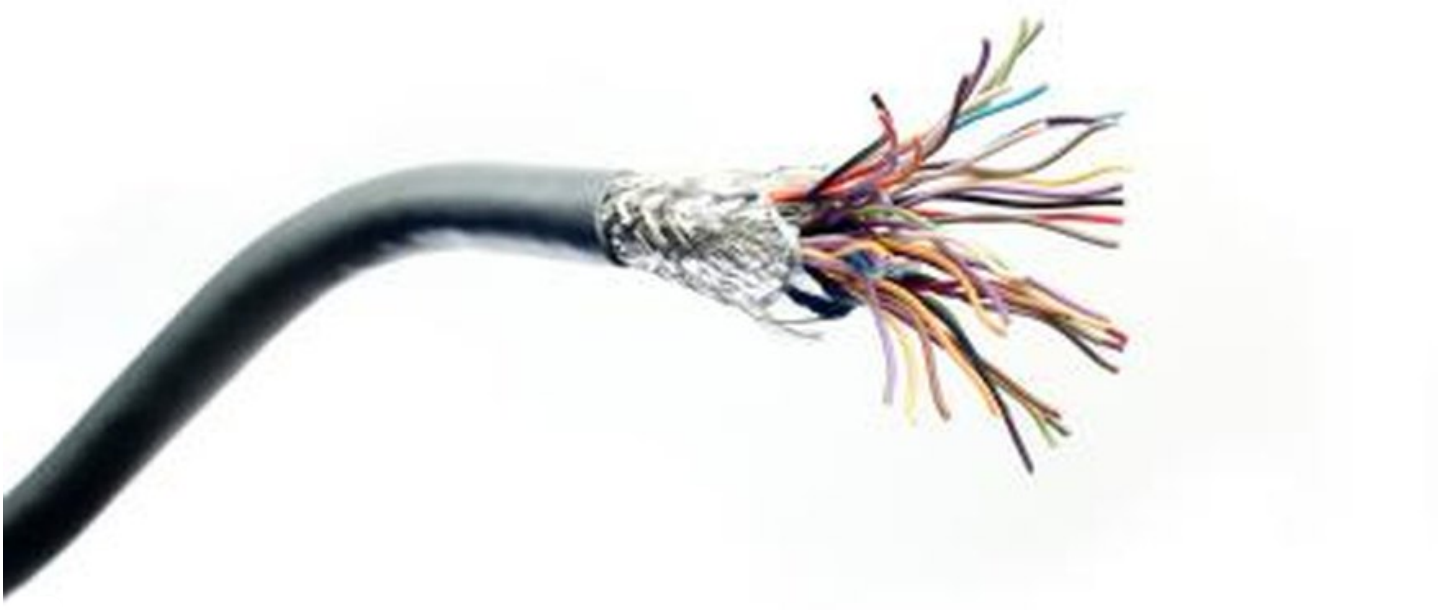
Types of Electrical Cable

Types of Electrical Cable



Updated March 13, 2018 *By Natasha Gilani*

An electrical cable, or power cable, is used to transmit electrical power. Electrical cables provide connection and allow power stations, wired computer networks, televisions, telephones and other electricity-powered devices to work. There are many types of electrical cables that differ in configuration, size and performance.

Components of Electrical Cables

All electrical cables consist of at least two conducting wires and an outer protective jacket. For medium to high power cables that carry high voltages, the conducting wires within the outer protective jacket may individually be enclosed in insulating sheaths. Electrical conductors are commonly made of copper. Synthetic polymers make the outer jacket and protective, insulating material.

Coaxial Cable

A coaxial electrical cable has a copper-plated core, surrounded by a dielectric insulator. A woven shield of copper surrounds the insulating layer, which is finally wound by an outmost plastic sheath. Coaxial cables differ in size, performance, flexibility, power handling capabilities and cost. They are used to connect home audio and video equipment, television networks and components of a local area network. Hard line, leaky cable, RG/6, twin-axial, biaxial and semi-rigid are types of coaxial cables.

Ribbon Cable

A ribbon electrical cable (also called multi-wire planar electrical cable or flat twin cables) is made up of multiple insulated wires running parallel to each other. These parallel wires allow the simultaneous transmission of multiple signals of data. According to “Optical Communications Essentials,” a typical ribbon cable consists of four to 12 wires. It is commonly used to interconnect network devices. Ribbon cables also connect the motherboard with other core CPU (central processing unit) components in computers.

Twisted Pair Cable

A twisted pair electrical cable consists of pairs of insulated copper wires (that are color coded), which are twisted around each other. The diameter of each wire ranges from 0.4 to 0.8 mm, and the number of pairs vary in different types of twisted pair cables. The greater the number of pairs, the higher the resistance of the cable will be to external noise and cross-talk. Twisted pair cables are easy to install, flexible and inexpensive. They are used for telephone cabling and to wire local area networks.

Shielded Cable

A shielded electrical cable is made of one or more insulated wires that are collectively enclosed by an aluminum Mylar foil or woven braid shielding. The shielding prevents the cable from external radio and power frequency interference, allowing the signal transmission to proceed smoothly. High-voltage power cables are commonly shielded.

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